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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

OFFICIAL

Appl.No.: 09/668,396
Appellant: Stachurski et al.
Filed: September 22, 2000
TC/A.U. 2654
Examiner: Nolan

Confirmation No.: 2375

Docket No.: TI-29493
Cust.No.: 23494

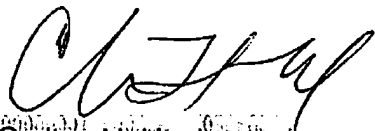
APPELLANTS' BRIEF (in triplicate)

Commissioner for Patents
P.O.Box 1450
Alexandria VA 22313-1450

Sir:

The attached sheets contain the Rule 192(c) items of appellants' brief. The Commissioner is hereby authorized to charge the fee for filing a brief in support of the appeal plus any other necessary fees to the deposit account of Texas Instruments Incorporated, account No. 20-0668. A fee transmittal sheet is enclosed.

Respectfully submitted,



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Rule 192(c)(1) Real party of interest

Texas Instruments Incorporated owns the application.

Rule 192(c)(2) Related appeals and interferences

There are no related dispositive appeals or interferences.

Rule 192(c)(3) Status of claims

Claims 1-4 are pending in the application with all claims finally rejected. This appeal involves the finally rejected claims.

Rule 192(c)(4) Status of amendments

There is no amendment after final rejection.

Rule 192(c)(5) Summary of the invention

The invention provides a methods of digital speech coding using linear prediction with a hybrid of both parametric coding (e.g., for strongly-voiced frames) and waveform coding (e.g., for weakly- or un-voiced frames) where the waveform coder includes a zero-phase equalization filter; Fig.1a shows functional blocks of a preferred embodiment encoder including the zero-phase equalization filter in the lower center. Application pages 28-30 and Figs.6a-6b describe the zero-phase equalization filtering of the waveform coding. In particular, Fig.6a shows both weakly-voiced (left portion) and strongly-voiced (right portion) residuals, and Fig.6b shows the same after zero-phase equalization filtering. Note the left portion of the residual has been sharpened and more closely resembles the right portion; this reduces discontinuities when switching from waveform to parametric coding.

Rule 192(c)(6) Issues

The issues presented on appeal are:

(1) whether claims 1-2 and 4 are patentable over the Gersho reference in view of the Honda reference.

(2) whether claim 3 is patentable over the Gersho reference in view of the Honda and Davis references.

Rule 192(c)(7) Grouping of the claims

The claims are grouped according to the rejections.

Rule 192(c)(8) Argument

(1) Claims 1-2 and 4 were rejected as unpatentable over Gersho in view of Honda. The Examiner cited Gersho as disclosing hybrid speech coding with both waveform and parametric coding and added Honda as disclosing a zero-phase equalization filter.

Appellants reply that the hybrid coding of Gersho already accounts for the phase discontinuity arising from switching between the waveform coder and the harmonic coder and does not suggest further adjustment such as by a zero-phase filtering of Honda. In fact, Honda is not hybrid coding. In more detail, Gersho accounts for the phase discontinuity for switching from waveform coding to harmonic coding by estimating the initial linear phase θ_0 for the harmonic coder from the preceding waveform by correlating the harmonic residual with the prior waveform coder residual; see column 15, lines 11-56 and block 34 in Fig.4A. Similarly, Gersho accounts for the linear phase discontinuity for switching from the harmonic coder to waveform coder by forcing the harmonic coder's linear phase onto the waveform coder; see column 16, lines 11-61 and block 38 in Fig.4A. There is no suggestion to replace this phase discontinuity approach with a phase equalization filtering as in Honda. Consequently, the requirement of both independent claims 1 and 4 of a zero-phase equalization filter for the waveform encoder is not suggested by the references, and claims 1-2 and 4 are patentable over the references.

(2) Claim 3 was rejected as unpatentable over Gersho in view of Honda and Davis. The Examiner applied Gersho and Honda as above and added Davis for the weakly-voiced and strongly-voiced synchronization.

Appellants repeat the foregoing arguments regarding the lack of suggestion to replace the phase discontinuity approach of Gersho with phase-equalization of Honda. Consequently, the references do not suggest the requirement of claim 3 of a waveform decoder adapted to decode zero-phase equalization filtered frames.

Rule 192(c)(9) Appendix

1. A hybrid speech encoder, comprising:

- (a) a linear prediction, pitch, and, voicing analyzer;
- (b) a parametric encoder coupled to said analyzer;
- (c) a waveform encoder coupled to said analyzer; and
- (d) wherein said waveform encoder includes a zero-phase equalization filter.

2. The encoder of claim 1, wherein:

- (e) said zero-phase equalization filter has coefficients determined by said analyzer.

3. A hybrid speech decoder, comprising:

- (a) a linear prediction synthesizer;
- (b) a parametric encoder coupled to said analyzer;
- (c) a waveform decoder coupled to said synthesizer; and
- (d) ~~(e)~~ wherein said waveform decoder decodes zero-phase equalized weakly-voiced frames time-synchronized with parametric decoder decoded strongly-voiced frames.

4. A speech encoder, comprising:

- (a) a linear prediction, pitch, and, voicing analyzer;
- (b) a waveform encoder coupled to said analyzer; and
- (c) wherein said waveform encoder includes a zero-phase equalization filter.